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(54) CONTROL DEVICE FOR PRINTER AND CONTROL METHOD FOR PRINTER

(57)Abstract:
PROBLEM TO BE SOLVED: To facilitate the design and modification of a task on a multitasking OS for a control device for printer, and furthermore to enhance the reusability and reliability of a program.
SOLUTION: This invented control device that executes more than one task, as its feature, provides more than one processing task for which specific processing for implementing a printing function with the printer is prescribed individually, and a control task that produces a command table prescribing the execution control of the more than one processing task, and a first processing task refers to the content prescribed in the command table and starts up a second processing task according to the referred content.

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CLAIMS

[Claim(s)]
[Claim 1]Two or more processing tasks as which it is a control device of a printer with which two or more tasks are performed, and concrete processing for making said printer realize a print function was specified, respectively, A control device of a printer, wherein it has a control task which creates a command table which specified execution control of two or more of said processing tasks and the 1st processing task starts the 2nd processing task according to contents this referred to with reference to contents specified to said command table.
[Claim 2]A control device of the printer according to claim 1 when print job data are received said control task from said host device, wherein it is started.
[Claim 3]A control device of the printer according to claim 1 or 2 when said control task is received [a quit command given from a processing task which should be started at the end], wherein it ends processing.
[Claim 4]A control device of a printer given in claims 1 thru/or 3, wherein said control task creates said command table according to print designation information included in print job data sent from a host device.
[Claim 5]A control device of a printer given in claims 1 thru/or 4, wherein said control task creates said command table which consists of a sub table which each of two or more of said processing tasks should refer to.
[Claim 6]Two or more processing means by which were a program which is executed on a control device of a printer and makes said printer realize a predetermined function, and concrete processing was specified, respectively in order to make said printer realize a print function, As a control means which creates a command table which specified execution control of two or more of said processing means, make a control device of said printer function it and the 1st processing means, A program characterized by operating a control device of said printer with reference to contents specified to said command table so that the 2nd processing

task may be started according to contents this referred to.

[Claim 7]A stage of being the control method of a printer, and starting a control task when print job data are received from a host device, A stage where said control task creates a command table which specified execution control of two or more processing tasks, A control method of a stage of performing said two or more processing tasks one by one according to said command table, and a printer characterized by making said printer realize a print function by performing said two or more processing tasks, ** and others, one by one.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Field of the Invention]Especially this invention relates to the control method of the task performed on the multitasking OS used for the control device of a printer about the control device and this control method of a printer.
[0002]
[Description of the Prior Art]If the printing target data as a print job is received from a host device etc., after a printer will change this into image data and will perform predetermined image processing, such as a halftone process, it realizes printing to print media by supplying print engine. Such processing (function) in a printer is controlled and realized by the control device formed in the inside.
[0003]The control device of a printer is what is called an embedded system by which the computer function was incorporated. A multitask operating system (henceforth "multitasking OS") is mounted in this embedded system. If multitasking OS is seen from a user, two or more tasks will be OS's performed by the concurrency target (concurrent).
Typically, what pursued real time nature is adopted.
An operating system including multitasking OS etc. can be considered as abstracted hardware including the system mounted of a certain kind. On multitasking OS, the program which specified the predetermined task (the contents of processing) is mounted, and an embedded system realizes desired processing as a whole by executing this program.
[0004]
[Problem(s) to be Solved by the Invention]In consideration of the characteristic of hardware including the system and peripheral equipment, etc., it is necessary to design the entire configuration and its internal processing sequence of a task under the multitasking OS for embedded systems represented by the multitasking OS for control devices of a printer.

[0005]Therefore, when it was going to hardware-ize the function realized by a certain task, in consideration of the characteristic of the newly constituted hardware, the design variation needed to be carried out about the composition and its internal processing sequence of the whole task. Such a design variation was a factor which gives a developer an unnecessary burden, checks shortening of a development cycle, and causes the rise of development cost as a result.
[0006]Then, it is making to carry out the design of the task in the multitasking OS for control devices of a printer, and for this invention to make a change easy, and to raise the reusability of a program, and reliability by extension into the technical problem.
[0007]
[Means for Solving the Problem]A gist of this invention has two or more tasks for making a printer realize a print function in performing, referring to a predetermined table (command table). Typically, two or more of these tasks are realized by program executed on multitasking OS mounted on a control device of a printer.
[0008]Namely, two or more processing tasks as which this invention is a control device of a printer with which two or more tasks are performed, and concrete processing for making said printer realize a print function was specified, respectively, Having a control task which creates a command table which specified execution control of two or more of said processing tasks, the 1st processing task is a control device of a printer starting the 2nd processing task according to contents this referred to with reference to contents specified to said command table. This invention is materialized also as a printer carrying a control device of such a printer.

[0009]Here, as for said control task, being started is preferred when print job data are received from said host device.
[0010]As for said control task, it is preferred to end processing, when a quit command given from a processing task which should be started at the end is received.
[0011]As for said control task, it is preferred to create said command table according to print designation information included in print job data sent from a host device, As for an account control task, it is preferred to create said command table which consists of a sub table which each of two or more of said processing tasks should refer to.
[0012]This invention is performed on a control device of a printer, and is materialized also as a recording medium which recorded a program which makes said printer realize a predetermined function, or this program. Namely, two or more processing means by which concrete processing was specified, respectively in order that a program concerning this invention might make said printer realize a print function, As a control means which creates a command table which specified execution control of two or more of said processing means, while operating a control device of said printer, A control device of said printer is operated so that the 1st

processing means may start the 2nd processing task according to contents this referred to with reference to contents specified to said command table.

[0013]This invention is materialized also as the control method of a printer. Namely, a control method of a printer concerning this invention, A stage of starting a control task when print job data are received from a host device, A stage where said control task creates a command table which specified execution control of two or more processing tasks, Said printer is made to realize a print function by performing a stage of performing said two or more processing tasks one by one according to said command table, and said two or more processing tasks, ** and others, one by one.

[0014]In this specification, a means does not only mean a physical means, and also when software realizes a function which the means has, it contains. Even if a function which one means has is realized by two or more physical means, a physical means whose function of two or more means is one may realize.

[0015]

[Embodiment of the Invention]Next, an embodiment of the invention is described, referring to drawings.

[0016]Drawing 1 is a figure showing an example of the hardware constitutions of the control device 1 of the printer concerning this embodiment. As shown in the figure, the control device 1 is the embedded system which was mutually connected by the internal bus, which was provided with the processor 11, ROM12, RAM13, the input interface circuit 14, and the image memory 15 and by which multitasking OS was mounted. On multitasking OS, two or more tasks specified by a predetermined program are performed in concurrency.

[0017]That is, the processor 11 executes various kinds of programs memorized by ROM12 and RAM13 under control of multitasking OS. That is, it has two incomes with other hardwares, and a printer is made to realize a predetermined function, when various kinds of programs are executed by the processor 11. Execution of various kinds of programs will be grasped as some tasks, if it sees from the batch of multitasking OS. It can grasp as a control task which controls the processing task group which performs actual processing, and a processing task group by this embodiment.

[0018]The input interface circuit 14 is for being connected to a host device etc. and receiving the input of print job data from a host device etc. As the input interface circuit 14, a network interfacing circuit, a parallel interface circuit, etc. are applicable, for example. Print job data are the command and/or data for making a printer print printing target data, and it is described according to predetermined printer language. Print designation information as shown, for example in drawing 2 is included in these print job data, and it is printed according to this print designation information. One or more graphics files according to general-purpose graphics formats, such as JPEG, are specified as a "printing-target-data name."

[0019]The image memory 15 memorizes the print image data (henceforth "image data") generated based on print job data. Controlling operation of the print engine 17, the engine controller 16 reads the image data developed by the image memory 15, and supplies it to the print engine 17. The engine controller 16 is started considering the printing executive instruction sent from the processor 11 as a trigger, for example, when the image data of a predetermined bandwidth is developed by the image memory 15. The print engine 17 is constituted by a paper handling mechanism, print head, etc., and prints to printing recording media, such as paper, for example. The thing according to the kind of printers 1, such as a laser beam printer and a serial printer, can be used for the print engine 17. In this embodiment, while a print head moves to a scanning direction, it shall be an ink-jet printer which injects ink and realizes printing to print media.

[0020]Drawing 3 is a figure for explaining the execution model of the task concerning this embodiment. As shown in the figure, the task performed on multitasking OS is grasped as control task 31 and processing task group 32-1,32-2 and --32-n. The control task 31 is a task for controlling the processing task group 31, and is a task first called at the time of starting of a program. If this control task 31 is called at the time of starting, it will generate the command table 33. Each of processing task group 32-1,32-2, --, 32-n, It is the task designed from viewpoints of the function etc. which the control device 1 should realize, and a defrosting task, a resizing task, an emphasis processing task, a layout process task, a halftone process task, a data sorting application task, etc. are prepared in this example.

[0021]A thawing treatment task thaws the image data into which JPEG etc. were compressed (extension), and performs processing for changing into incompressible image data (typically bit map data). A resize processing task performs processing for expanding or reducing the image data (bit map data) thawed by the thawing treatment task to predetermined image size. Since it is not necessarily required, this resize processing is specified as an option item. An emphasis processing task performs processing for emphasizing the edge part in bit map data, for example. Emphasis processing is also specified as an option item. A layout process task performs processing for arranging bit map data to the depiction area which should be formed on the image memory 15. The print area on print media is supported with the depiction area here. A halftone process task performs a halftone process to the bit map data arranged in the depiction area on the image memory 15. A halftone process is for performing gray scale representation of the picture expressed by print media. A data sorting application task performs processing for rearranging the picture-element-data line which should be printed in one movement of a print head for high density printing. That is, for example, the ink jet mouth density of a print head is 120dpi, and suppose that actual printing picture element density is 360dpi. In this case, supposing there is a picture-element-data line of 12 lines, the 1st order [in / 1, 4, 7 or 10 lines, and the 2nd time (2, 5, 8 or 11 lines, and the 3rd time) will be 3, 6, and

9 or 12 lines, and / the depiction area on the image memory 15] of a row and actual order of printing will be different as turn of a print line. Therefore, the data sorting application task is prepared as processing for buffering the difference between such both.

[0022]The command table 33 is generated by starting of a control task on a memory. It is referred to by each of 32-n and this command table 33 has specified [processing task group 32-1,32-2, --,] the execution control between these processing task groups 32. Drawing 4 is a figure for explaining the command table 33 concerning this embodiment. As shown in the figure, the command table 33 comprises processing task group 32-1,32-2, --, a sub table to each of 32-n. Each sub table comprises "the command to next task", "task [next] ID", "a return command to a last task", "last task ID", an "error command", "error command report destination task ID", and a "data pointer."

[0023]The command published in order to pass processing to the following task when the processing task ends processing is stored in "the command to next task", and task ID of the processing task to which processing is passed is stored in "task [next] ID." When the processing task ends processing, the return command published to the processing task which published the processing command is stored in "the return command to a last task", and task ID of the processing task which publishes the return command is stored in it at "last task ID." The command notified in the middle of the processing in the processing task when the error condition which cannot continue processing occurs is stored in an "error command", and a core is made "error command report destination task ID" for task ID of the processing task which notifies the error command. The pointer on the memory in which the data which should be handed over to processing of the following task is stored is stored in a "data pointer."

[0024]Here, outline operation of the task in the execution model shown in drawing 3 is explained. First, if the control task 31 is started, this control task 31 will generate the command table 33 on a memory, and will start the processing task 32-1 which should be started first. That is, this means that control of execution moved from the control task 31 to the processing task 32-1. At this time, the control task 31 specifies a head position as a position of the command table 33 which the processing task 32-1 should refer to. The control task 31 stands by after starting the processing task 32-1 until it receives a quit command from the last processing task 32-n.

[0025]The processing task 32-1 started by the control task 31 acquires the contents with reference to the position (that is, head position) as which the command table 33 was specified, after carrying out the processing sequence specified to self. Among those the processing task 32-1 acquired, it publishes a command to the following processing task 32-2 according to **. At this time, the processing task 32-1 updates the position of the command table 33 which the following processing task 32-2 should refer to in the position of the following sub table. When the processing task 32-1 receives a return command from the started processing task 32-2, it

ends processing.

[0026]The processing task 32-2 will be started by issue of this command. The processing task 32-2 also acquires the contents with reference to the position as which the command table 33 was specified, after carrying out the processing sequence specified to self. It updates the position which should refer to the command table 33 while it publishes a command to the following processing task 32-3 according to **, among those processing a lot of rain **** 32-2 acquired. Henceforth, the task which should be performed to the last processing task 32-n is succeeded similarly. The last processing task 32-n takes over execution to the control task 32 according to the contents shown in the command table 33, and ends own processing. And if the control task 31 has processing succeeded from the last processing task 32-n, end processing will be performed and it will be completed.

[0027]The control task 31 is a task which manages control of execution of the processing task group 32 whole via the command table 33. Therefore, for example, in replacing an order of the execution control between the processing tasks 32, if the control task 31 is corrected so that the sub table of new contents may be added to the command table 33, it is sufficient. It is sufficient, if it corrects similarly when new processing task 32-x tends to be added or it is going to replace now. Since such correction does not take the composition of the whole processing task into consideration, it makes a developer's burden reduced.

[0028]Next, the example of the control device of the printer concerning this embodiment of operation is explained using drawing 5 - drawing 9. Namely, drawing 5 and drawing 6 are operation of the whole task the flow charts for explaining, and drawing 7, The figure in which the flow chart for explaining command table creation processing and drawing 8 show an example of the command table 33, and drawing 9 are the flow charts for explaining the generation processing of the sub table to a thawing treatment task as an example of creation processing of a sub table. In this embodiment, a defrosting task, a resizing task, an emphasis processing task, a layout process task, a halftone process task, a data sorting application task, etc. shall be prepared as a processing task.

[0029]First, as shown in drawing 5, the control device of a printer will start the control task 31, if print job data are received. This control task 31 creates the command table 33 to the global area on a memory (STEP501).

[0030]Here, command table creation processing is explained. That is, as shown in drawing 7, the control task 31 sets print designation information there, after securing the global area for command table 33 on a memory (STEP701) (STEP702). The control task 31 creates the sub table to a resize processing task, an emphasis processing task, and/or a layout process task according to the contents specified by print designation information while creating the sub table to a thawing treatment task (STEP703). This processing is mentioned later. And the control task 31 creates the sub table to a halftone process, and the sub table to a data sorting

application task, respectively (STEP704 and 705).

[0031]Drawing 8 shows an example of the command table 33 which did in this way and was created. The command table 33 of this example comprises sub table A-F to each processing task group 32. Namely, a sub table [as opposed to a thawing treatment task in the sub table A], A sub table [as opposed to an emphasis processing task in a sub table and the sub table C], [as opposed to a resize processing task in the sub table B] A sub table and the sub table F show an example of the sub table to a data sorting application task. [as opposed to a halftone process task in a sub table and the sub table E] [as opposed to a layout process task in the sub table D] Since resize processing and emphasis processing are options, respectively, the sub table to the processing task which performs processing which was not specified will be created.

[0032]When it returns to drawing 5 and the command table 33 is created, the control task 31, While setting to the global area on a memory the pointer for referring to the printing target data specified by the print designation information included in print job data, The value which shows the head position of the command table 33 is set to a pointer (STEP502), and a start-of-printing command is published to a thawing treatment task (STEP503). The control task 31 stands by until a printing quit command is published from the data sorting application task which is the last processing task.

[0033]The thawing treatment task started from the control task 31 performs thawing treatment based on the print designation information set to the global area (STEP504). Next, a thawing treatment task acquires the contents with reference to the command table 33 based on the value of the pointer set to the global area (STEP505). That is, the sub table A of the head position of the command table 33 will be referred to. After reference, a thawing treatment task updates the value of a pointer so that the following sub table B may be referred to, and it publishes (STEP506)., the following processing command, i.e., resizing start command

[0034]The resize processing task started from the thawing treatment task performs resize processing based on the print designation information set to the global area (STEP507). Resize processing is processing which performs expansion/reduction of a picture. Next, a resize processing task acquires the contents with reference to the sub table B of the command table 33 based on the value of the pointer set to the global area (STEP508). After reference, a resize processing task updates the value of a pointer so that the following sub table C may be referred to, it publishes an emphasis processing start command as a following processing command (STEP509), and publishes a return command to a thawing treatment task (STEP510). Thereby, a thawing treatment task performs end processing of releasing the field on the memory which was being used, and ends own processing.

[0035]The emphasis processing task started from the resize processing task performs emphasis processing based on the print designation information set to the global area

(STEP511). Next, an emphasis processing task acquires the contents with reference to the sub table C of the command table 33 based on the value of the pointer set to the global area (STEP512). After reference, an emphasis processing task updates the value of a pointer so that the following sub table D may be referred to, it publishes, the following processing command, i.e., arrangement request command, (STEP513), and publishes a return command to a resize processing task (STEP514). Thereby, a resize processing task ends own processing.

[0036]The layout process task started from the emphasis processing task performs processing for arranging printing target data (that is, thawed image data) to the depiction area on image memory (STEP515 of drawing 6). Next, a layout process task acquires the contents with reference to the sub table D of the command table 33 based on the value of the pointer set to the global area (STEP516). After reference, a layout process task updates the value of a pointer so that the following sub table E may be referred to, it publishes a halftone process demand command (STEP517), and publishes a return command to a resize processing task (STEP518). Thereby, an emphasis processing task ends own processing.

[0037]The halftone process task started from the layout process task performs a halftone process to the printing target data arranged in the depiction area on image memory (STEP519). Next, a halftone process task acquires the contents with reference to the sub table E of the command table 33 based on the value of the pointer set to the global area (STEP520). After reference, a halftone process task updates the value of a pointer so that the following sub table D may be referred to, it publishes a data sorting application demand command (STEP521), and publishes a return command to a layout process task (STEP522). Thereby, a layout process task ends own processing.

[0038]The data sorting application processing task started from the halftone process task performs rearrangement processing of the printing target data arranged in the depiction area on image memory (STEP523). Next, a data sorting application task acquires the contents with reference to the sub table F of the command table 33 based on the value of the pointer set to the global area (STEP524). A data sorting application task publishes a printing job quit command to the control task 33 (STEP525), and publishes a return command to a layout process task (STEP526). Thereby, a data sorting application task ends own processing.

[0039]Next, the processing shown in STEP703 is explained as an example of creation of a sub table using drawing 9.

[0040]That is, as shown in the figure, the control task 33 sets the pointer in which the sub table which should be observed as a candidate for creation is shown first (STEP901). Here, the sub table A is set as a candidate for creation. Next, the control task 33 sets NULL to the return command field of the sub table, and return command issue task ID areas, respectively (STEP902 and 903). This is because the task which becomes a starting agency is a control

task. Next, while setting the return command to a thawing treatment task to the return command field of the following sub table (this example the sub table B) (STEP904), task ID of a thawing treatment task is set to return command issue task ID areas (STEP905). Next, the control task 33 judges whether resize processing is specified in print designation information (STEP906). When resize processing is specified, The control task 33 sets task ID of a resize processing task to command issue task ID areas while setting the command over a resize processing task to the issuing command field of the sub table A (STEP907) (STEP908). Then, the control task 33 sets to error command issue task ID areas task ID of the task which should notify an error while setting an error command to the error command field of the sub table A (STEP909) (STEP910). In this example, although the control task is specified, it does not adhere to in particular this. Since creation of the sub table A was completed, by this the control task 33, A pointer is set that an attention sub table should be shifted to the following sub table B (STEP911), While setting the return command to a resize processing task to the return command field of the following sub table (sub table C) (STEP912), task ID of a resize processing task is set to return command issue task ID areas (STEP913).

[0041]When it is judged through the above processing that resize processing is not specified in STEP906, the control task 33 judges whether emphasis processing is specified in print designation information (STEP914 of drawing 10). When gradation processing is specified, the control task 33, While setting the command over a gradation processing task to the issuing command field of the sub table for creation (this example the sub table B) (STEP915), task ID of a gradation processing task is set to command issue task ID areas (STEP916). Then, the control task 33 sets to error command issue task ID areas task ID of the task which should notify an error while setting an error command to the error command field of the sub table B for creation (STEP917) (STEP918). In this example, the thawing treatment task which became the starting agency is specified. By this, creation of the sub table B is completed and the control task 33, An attention sub table that it should shift to the following sub table (sub table C), Set a pointer (STEP919) and the return command to an emphasis processing task, While setting to the return command field of the following sub table (sub table C) (STEP920), task ID of an emphasis processing task is set to return command issue task ID areas (STEP921).

[0042]When it is judged through the above processing that gradation processing is not specified in STEP914, While setting the command over a layout process task to the issuing command field of the sub table for creation (this example the sub table C) (STEP922), task ID of a layout process task is set to command issue task ID areas (STEP923). Then, the control task 33 sets to error command issue task ID areas task ID of the task which should notify an error while setting an error command to the error command field of the sub table C for creation (STEP924) (STEP925). Thereby, the creation to the sub table C is completed. Since resize processing and emphasis processing are option specification, it is the above branching control,

but the branching control according to the given processing will comprise this example.
[0043]In creation of the sub table to a thawing treatment task, since the data which should be referred to is not given, a data pointer is not set, but in other processing tasks, when the data which should be referred to is given, a data pointer will be set.
[0044]Although we decided to use a flow chart sequential about operation of the task in the control device of a printer in the above-mentioned explanation, it is not limited to in particular this. Therefore, unless inconsistency arises in operation, an order of processing may be replaced, or it may constitute so that it may operate in parallel if needed.
[0045]As mentioned above, according to this embodiment, execution of the processing task group 32 will be controlled by the control task 31 via the command table 33. Therefore, for example, in replacing an order of the execution control between the processing task groups 32, if the control task 31 is corrected so that the sub table of new contents may be added to the command table 33, it is sufficient. It is sufficient, if it corrects similarly when new processing task 32-x tends to be added or it is going to replace now. Since such correction does not take the composition of the whole processing task into consideration, it makes a developer's burden reduced.
[0046]The above-mentioned embodiment is illustration for explaining this invention, and is not the meaning which limits this invention only to this embodiment. This invention can be carried out with various gestalten, unless it deviates from the gist.
[0047]
[Effect of the Invention]According to this invention, it becomes easy about the design of the task in the multitasking OS for control devices of a printer, and change, and the reusability of a program and reliability will improve by extension.

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]
[Drawing 1]It is a figure showing an example of the hardware constitutions of the control device 1 of the printer concerning one embodiment of this invention.
[Drawing 2]It is a figure showing an example of the print designation information concerning one embodiment of this invention.
[Drawing 3]It is a figure for explaining the execution model of the task concerning one embodiment of this invention.
[Drawing 4]It is a figure showing an example of the command table concerning one embodiment of this invention.
[Drawing 5]It is a flow chart for explaining operation of the task in the control device of the printer concerning one embodiment of this invention.
[Drawing 6]It is a flow chart for explaining operation of the task in the control device of the printer concerning one embodiment of this invention.
[Drawing 7]It is a flow chart for explaining the command table creation processing concerning one embodiment of this invention.
[Drawing 8]It is a figure showing an example of the command table concerning one embodiment of this invention.
[Drawing 9]It is a flow chart for explaining an example of the generation processing of the sub table concerning one embodiment of this invention.
[Drawing 10]It is a flow chart for explaining an example of the generation processing of the sub table concerning one embodiment of this invention.
[Description of Notations]
1 -- Control device
11 -- Processor
12 -- ROM

13 -- RAM
14 -- Input interface circuit
15 -- Image memory
16 -- Engine controller
17 -- Print engine
31 -- Control task
32 -- Processing task
33 -- Command table

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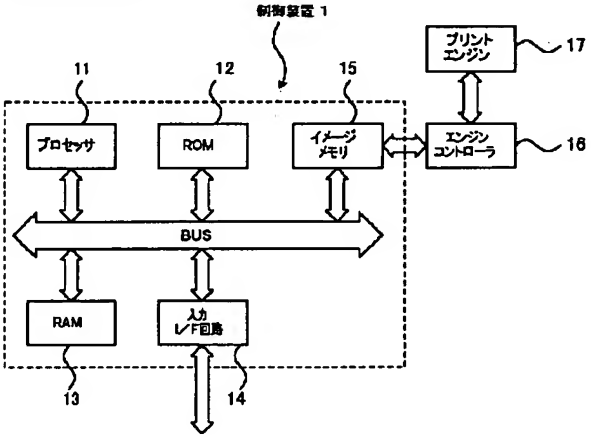
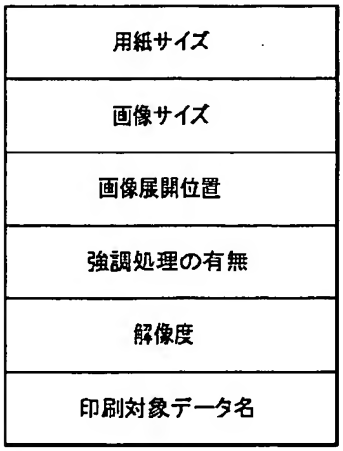
DRAWINGS

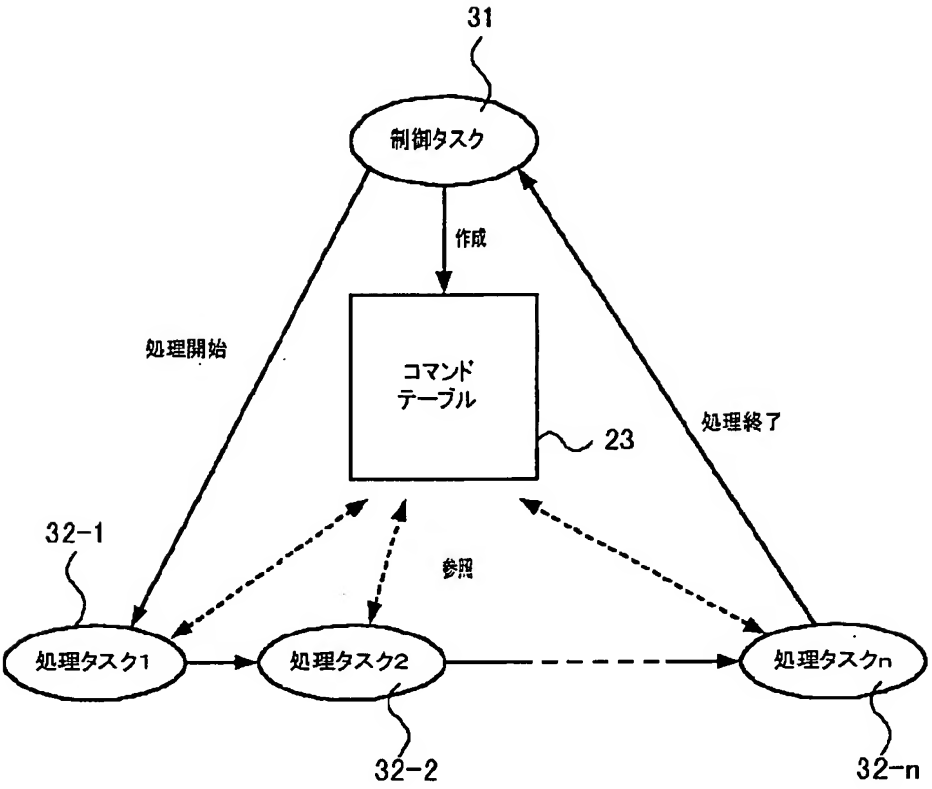
[Drawing 1]



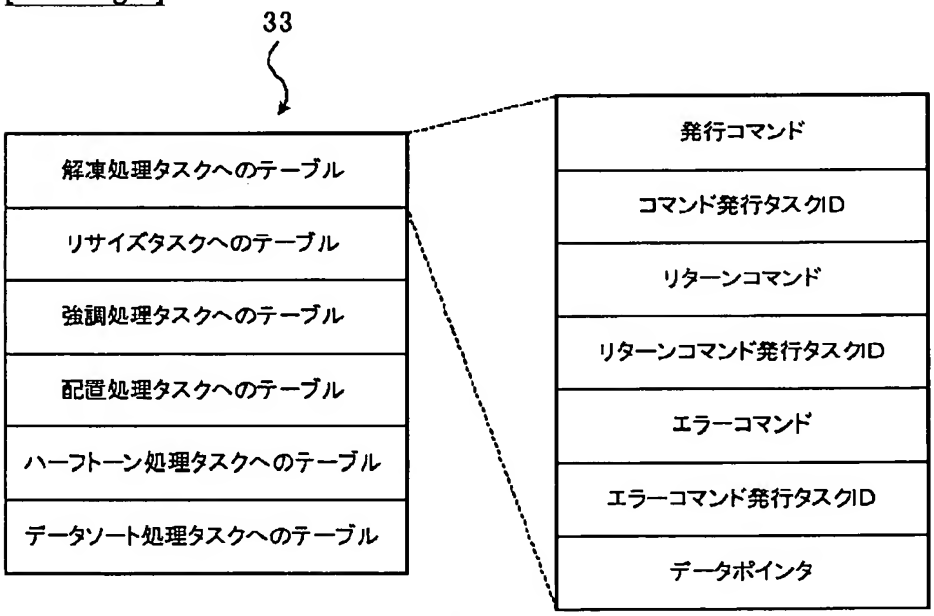
[Drawing 2]



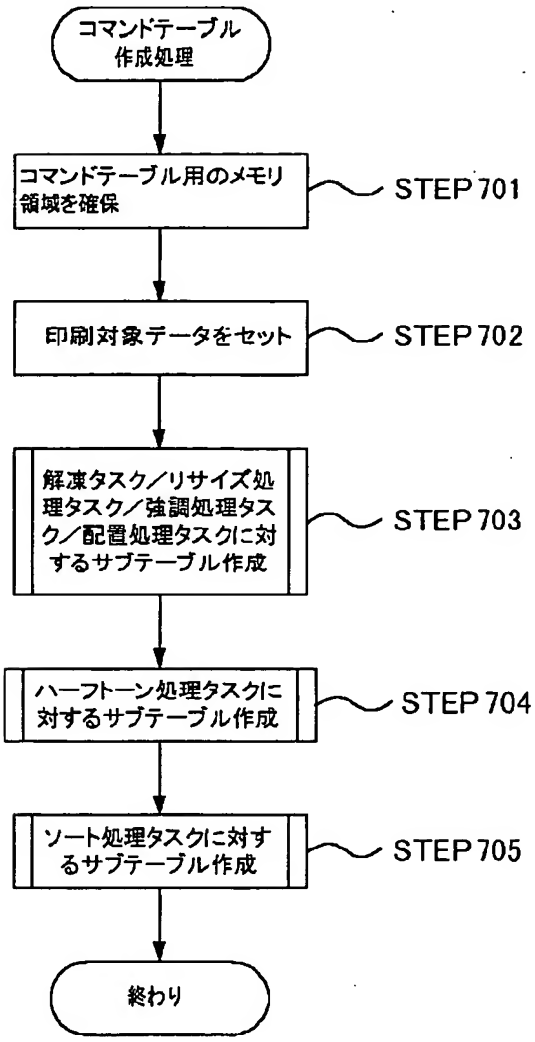
[Drawing 3]



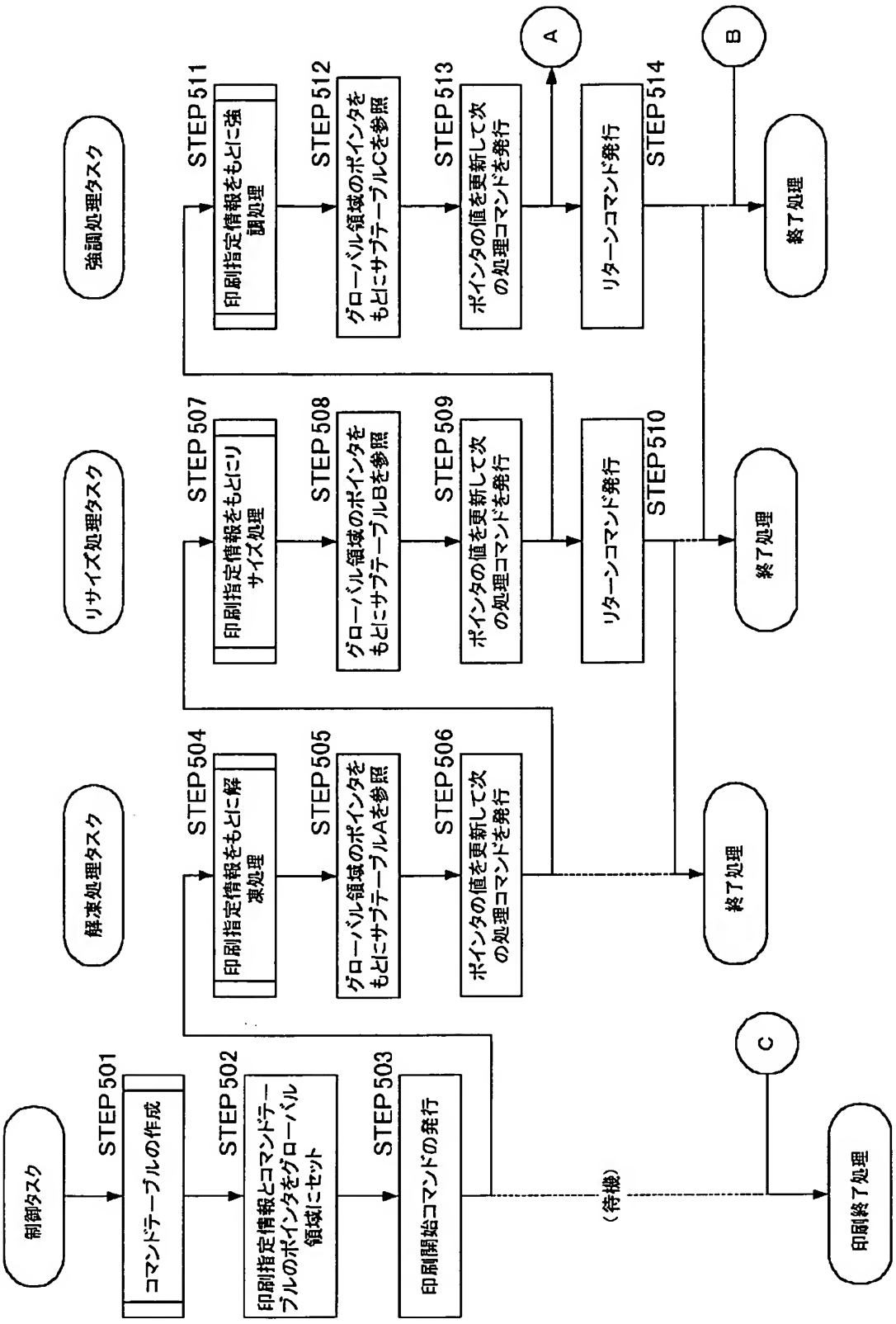
[Drawing 4]



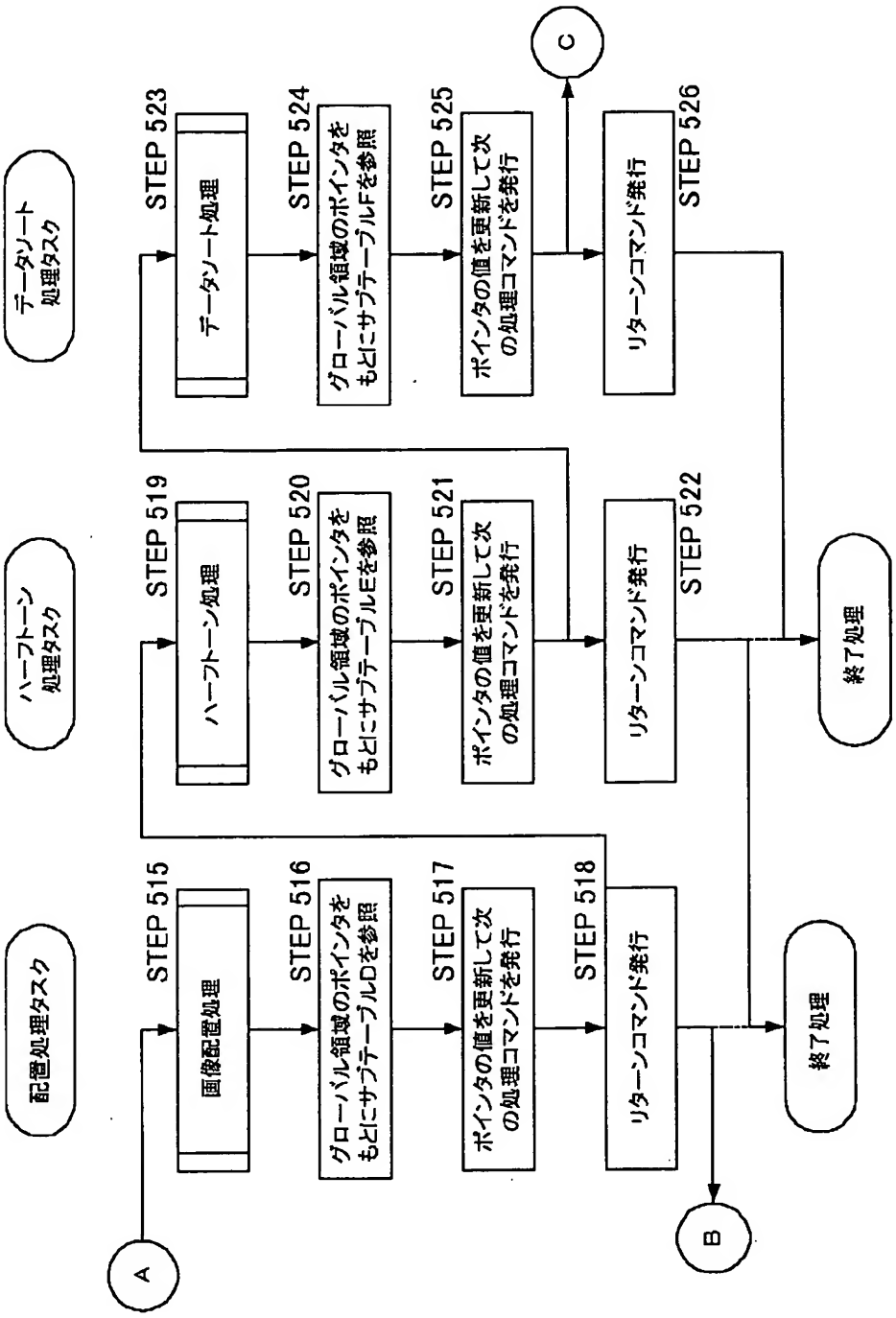
[Drawing 7]


コマンドテーブル作成処理
コマンドテーブル用のメモリ領域を確保
STEP 701
印刷対象データをセット
STEP 702
解凍タスク／リサイズ処理タスク／強調処理タスク／配置処理タスクに対するサブテーブル作成
STEP 703
ハーフトーン処理タスクに対するサブテーブル作成
STEP 704
ソート処理タスクに対するサブテーブル作成
STEP 705
終わり

[Drawing 5]


制御タスク
STEP501
コマンドテーブルの作成
STEP502
印刷指定情報とコマンドテーブルのポインタをグローバル領域にセット
STEP503
印刷開始コマンドの発行
(待機)
C
印刷終了処理
解凍処理タスク
STEP504
印刷指定情報をもとに解凍処理
STEP505
グローバル領域のポインタをもとにサブテーブルAを参照
STEP506
ポインタの値を更新して次の処理コマンドを発行
終了処理
リサイズ処理タスク
STEP507
印刷指定情報をもとにリサイズ処理
STEP508
グローバル領域のポインタをもとにサブテーブルBを参照
STEP509
ポインタの値を更新して次の処理コマンドを発行
リターンコマンド発行
STEP510
終了処理
強調処理タスク
STEP511
印刷指定情報をもとに強調処理
STEP512
グローバル領域のポインタをもとにサブテーブルCを参照
STEP513
ポインタの値を更新して次の処理コマンドを発行
A
リターンコマンド発行
STEP514
B
終了処理

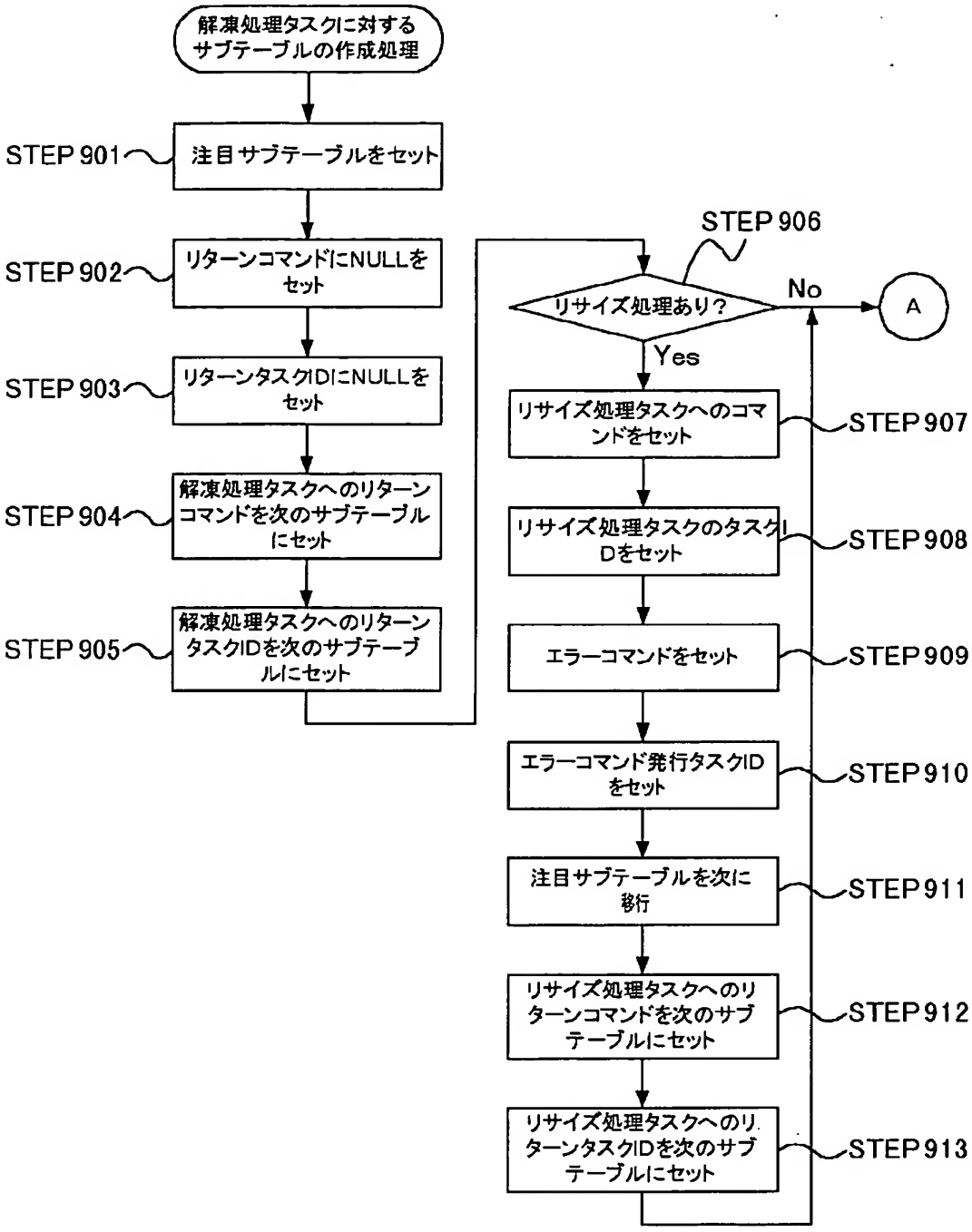
[Drawing 6]


配置処理タスク
ハーフトーン処理タスク
データソート処理タスク
STEP 515
画像配置処理
STEP 516
グローバル領域のポインタをもとにサブテーブルDを参照
STEP 517
ポインタの値を更新して次の処理コマンドを発行
STEP 518
リターンコマンド発行
STEP 519
ハーフトーン処理
STEP 520
グローバル領域のポインタをもとにサブテーブルEを参照
STEP 521
ポインタの値を更新して次の処理コマンドを発行
STEP 522
リターンコマンド発行
STEP 523
データソート処理
STEP 524
グローバル領域のポインタをもとにサブテーブルFを参照
STEP 525
ポインタの値を更新して次の処理コマンドを発行
STEP 526
リターンコマンド発行
終了処理
終了処理
A
B
C

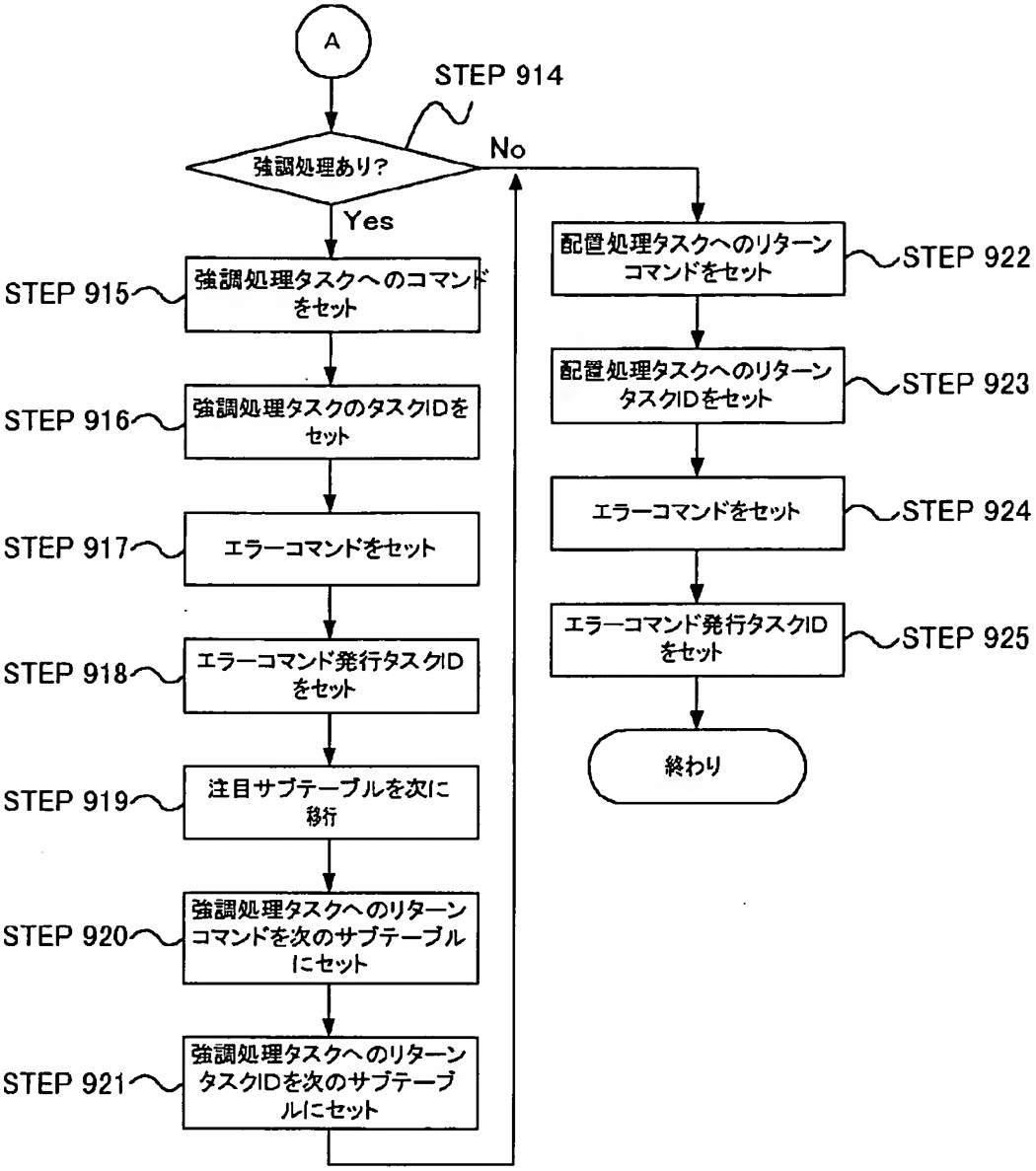
[Drawing 8]

サブテーブルA	リサイズ開始コマンド
	リサイズ処理タスク
	なし
	なし
	解凍エラー
	制御タスク
	なし
サブテーブルB	強調処理開始コマンド
	強調処理タスク
	データ処理完了通知
	解凍処理タスク
	リサイズエラー
	制御タスク
	解凍データ格納バッファの先頭
サブテーブルC	配置依頼コマンド
	配置処理タスク
	データ処理完了通知
	リサイズ処理タスク
	強調処理エラー
	制御タスク
	リサイズデータ格納バッファの先頭
サブテーブルD	ハーフトーン処理要求コマンド
	ハーフトーン処理タスク
	データ処理完了通知
	強調処理タスク
	なし
	なし
	強調処理データ格納バッファの先頭
サブテーブルE	データソート処理要求コマンド
	データソート処理タスク
	データ処理完了通知
	配置処理処理タスク
	ハーフトーン処理エラー
	制御タスク
	配置完了データ格納バッファの先頭
サブテーブルF	印刷処理終了コマンド
	制御タスク
	データ処理完了通知
	ハーフトーン処理タスク
	データソートエラー
	制御タスク
	ハーフトーンデータ格納バッファの先頭

[Drawing 9]


解凍処理タスクに対するサブテーブルの作成処理
STEP 901
注目サブテーブルをセット
STEP 902
リターンコマンドにNULLをセット
STEP 903
リターンタスクIDにNULLをセット
STEP 904
解凍処理タスクへのリターンコマンドを次のサブテーブルにセット
STEP 905
解凍処理タスクへのリターンタスクIDを次のサブテーブルにセット
STEP 906
リサイズ処理あり?
No
A
Yes
リサイズ処理タスクへのコマンドをセット
STEP 907
リサイズ処理タスクのタスクIDをセット
STEP 908
エラーコマンドをセット
STEP 909
エラーコマンド発行タスクIDをセット
STEP 910
注目サブテーブルを次に移行
STEP 911
リサイズ処理タスクへのリターンコマンドを次のサブテーブルにセット
STEP 912
リサイズ処理タスクへのリターンタスクIDを次のサブテーブルにセット
STEP 913

[Drawing 10]



[Translation done.]

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1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

CORRECTION OR AMENDMENT

[Kind of official gazette]Printing of amendment by the regulation of 2 of Article 17 of Patent Law

[Section classification] The 3rd classification of the part VI gate
[Publication date]December 2 (2004.12.2), Heisei 16

[Publication No.]JP,2002-297404,A (P2002-297404A)
[Date of Publication]October 11, Heisei 14 (2002.10.11)
[Application number]Application for patent 2001-98140 (P2001-98140)
[The 7th edition of International Patent Classification]

G06F 9/46

B41J 29/38

G06F 3/12
[FI]

G06F 9/46 340 B

B41J 29/38 Z

G06F 3/12 C
[Written amendment]
[Filing date]December 16, Heisei 15 (2003.12.16)
[Amendment 1]
[Document to be Amended]Specification
[Item(s) to be Amended]Claim
[Method of Amendment]Change
[The contents of amendment]

[Claim(s)]
[Claim 1]
It is a control device of a printer with which two or more tasks are performed,
Two or more processing tasks as which concrete processing for realizing a print function was specified to said printer, respectively,
According to print designation information included in print job data sent from a host device, it has a control task which creates a command table which specified execution control of two or more of said processing tasks,
The 1st processing task,
A control device of a printer characterized by starting the 2nd processing task according to contents this referred to with reference to contents specified to said command table.
[Claim 2]
Said control task,
A control device of the printer according to claim 1 characterized by being started when print job data are received from said host device.
[Claim 3]
Said control task,
A control device of the printer according to claim 1 or 2 characterized by ending processing when a quit command given from a processing task which should be started at the end is received.
[Claim 4]
Said control task,
A control device of a printer given in claims 1 thru/or 3 creating said command table which consists of a sub table which each of two or more of said processing tasks should refer to.
[Claim 5]
It is the control method of a printer,
A stage of starting a control task when print job data are received from a host device,
A stage where said control task creates a command table which specified execution control of two or more processing tasks according to print designation information included in said print job data,
A stage of performing said two or more processing tasks one by one according to said command table, ** and others,
A control method of a printer making said printer realize a print function by performing said two or more processing tasks one by one.
[The amendment 2]
[Document to be Amended]Specification
[Item(s) to be Amended]0023

[Method of Amendment]Change
[The contents of amendment]
[0023]
The command published in order to pass processing to the following task when the processing task ends processing is stored in "the command to next task", and task ID of the processing task to which processing is passed is stored in "task [next] ID." When the processing task ends processing, the return command published to the processing task which published the processing command is stored in "the return command to a last task", and task ID of the processing task which publishes the return command is stored in it at "last task ID." The command notified in the middle of the processing in the processing task when the error condition which cannot continue processing occurs is stored in an "error command", and task ID of the processing task which notifies the error command is stored in "error command report destination task ID." The pointer on the memory in which the data which should be handed over to processing of the following task is stored is stored in a "data pointer."
[Amendment 3]
[Document to be Amended]Specification
[Item(s) to be Amended]0026
[Method of Amendment]Change
[The contents of amendment]
[0026]
The processing task 32-2 will be started by issue of this command. The processing task 32-2 also acquires the contents with reference to the position as which the command table 33 was specified, after carrying out the processing sequence specified to self. It updates the position which should refer to the command table 33 while it publishes a command to the following processing task 32-3 according to **, among those the processing task 32-2 acquired. Henceforth, the task which should be performed to the last processing task 32-n is succeeded similarly. The last processing task 32-n takes over execution to the control task 32 according to the contents shown in the command table 33, and ends own processing. And if the control task 31 has processing succeeded from the last processing task 32-n, end processing will be performed and it will be completed.

[Translation done.]